CEDAR INTERNAL CORRESPONDENCE

DATE: 6/11/91

TO: File

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SUBJECT: Du Pont PIBA Project

Attached is an economic analysis of this project utilizing du Pont supplied data. The data was supplied by Elaine Donald on May 10, 1991, and consisted of a conceptual equipment list for a four million pound per year plant together with raw material charges and operating procedure outlines. This information was adjusted to utilize the RP10 unit and it was assumed that capital modifications would be restricted to nonmajor items.

It would appear that the chlorination would not be the controlling factor on productivity, although it is unclear just how much HCL stripping is required. Waste from this portion of the process appears to be a minor economic problem if deepwell disposal is acceptable.

The amination step appears to be the controlling factor for productivity and the economics can be affected dramatically by the efficiency of the DMAPA and heptane recovery. The amination waste appears to be a significant cost factor in the form of high cost to incinerate organic residues. The basis for the amount of organic residues shown is unclear and will bear investigation.

It would appear that a single 4,000 gallon amination reactor could generate approximately two million pounds per year of 100% PIBA and therefore, to obtain a four million pound rate, two reactors would have to be used.

I am aware that du Pont has received a quotation of $3.00 per pound for PIBA and is questioning whether this is a fair price even though they appear able to pay it. Based upon this preliminary analysis, it would seem that $3.00 is not out of line for this product.

I would appreciate those copied reviewing this data to determine any invalid assumptions that could change the economics drastically. In the meantime, I recommend that Bill continue with his laboratory evaluation of the process. If no significant error is uncovered in the analysis, I would propose

to inform du Pont that the price is unlikely to be significantly lower than $3.00 unless we see some significant changes in the amount of waste generated or the production rate. Based on their response, we can decide if the product should be pursued beyond the laboratory evaluation.

Geoffrey L. Pratt

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Attachment

Dupont PIBA Project

PIBC

Raw Materials

	#/# PIBC	$/# rm	$/# PIBC
Polyisobutylene	0.99	0.45	0.45
Heptane	0.99	0.70	0.69
Iodine	0.00052	17.00	0.01
Chlorine	0.1393	0.02	0.00
NaoH 50%	0.2426	0.10	0.02
PIBC 100% Basis		Sub Total	1.17
PIBC 51.4% As Is			0.60
Waste Deepwell	0.95	0.04	0.04
PIBC 100% Basis		Sub Total	1.21
PIBC 51.4% As Is			0.62

PIBA

	#/# PIBA	$/# rm	$/# PIBA
DMAPA	0.2354	1.23	0.29
K2CO3	0.1083	0.45	0.05
PIBC Solution	1.877	0.62	1.17
Heptane	0.29	0.70	0.20
		Sub Total	1.71
DMAPA Recovery	-0.1275	1.23	-0.16
Heptane Recovery	-1.01	0.7	-0.71
		Sub Total	0.85
Waste Deepwell	1.17	0.04	0.05
Incinerate	0.38	1.00	0.38
Dilution HAN	1.00	0.26	0.26
Total Matls & Waste	100% PIBA		1.53

Production Costs basis 4000 gallon reactors

#PIBA per batch 8000

Time per batch-hrs	
Chlorination + HCL Strip	24
Amination thru step 11	30
Washing & stripping concurrent	
Daily Processing Costs $	5500
Capital Cost $-M	400

Process Cost / #PIBA 0.86

Prod'n Cost	2-MM lbs	100%	2.39
	4-MM lbs		1.96

	GP	M-$ 2-MMlbs	Selling Price
10% GP		532	2.66
20% GP		1197	2.99
30% GP		2052	3.42

	GP	M-$ 4MM-lbs	
10% GP		873	2.18
20% GP		1964	2.46
30% GP		3368	2.81